

Fibonacci magic

by Theoni Pappas

a) Select any 2 numbers and generate a Fibonacci-like sequence.

Draw immediately sum up the first ten. **It will be 11 x the 7th number.**

Why the trick works?

prove using a and b to generate a Fibonacci-like sequence, and add the first 10.

| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th |
|--|-----|-------|--------|---------|----------|---------|----------|-----------|-----------|
| a | b | (a+b) | (a+2b) | (2a+3b) | ((3a+5b) | (5a+8b) | (8a+13b) | (13a+21b) | (21a+35b) |
| totals = 55a+88b = 11(7th term) | | | | | | | | | |

b) Select any 2 numbers and generate a Fibonacci-like sequence. List as many as you want.

Draw a line and immediately add up every number above the line.

TRICK: $f_1 + f_2 + f_3 + \dots + f_n = f_{n+2} - f_2$ that is the sum of the first n numbers is the nth+2n number minus the 2nd number

a
b
(a+b)
(a+2b)
(2a+3b)
((3a+5b)
(5a+8b) —> these total: **13a+20b**
(8a+13b)
(13a+21b)

NOTE: The 2nd number beyond the sum is 13a+21b —> so to make them equal must look at the 2nd term of the sequence. It is b, and subtract it from the 2nd term beyond the sum. We get 13a+21b - b = **13a+20b**